ABOUT THE INSTITUTION

The Kovai Kalaimagal Educational Trust established in the year 1992 with an aspiration to quench the educational thirst of the poor and the needy strata of the society particularly from rural area. It sprouted with the establishment of a school and soon extended to add Kovai Kalaimagal College of Arts and Science in the year 1996 – 1997, Coimbatore Institute of Management and Technology in 1996 – 1997, Coimbatore Institute of Engineering and Technology in 2001 – 2002 and CIET School of Architecture in 2013 – 2014. The trust is managed by the dedicated team of trustees Dr. T. Banumathi, Dr. T. Namradha, Dr. K. A. Chinnaraju, Tmt. P. Shanmugadevi, Thiru. S. Subramanian and Thiru. M. Thangavelu who fully devote their time for the development of the institutions under the trust and it is due to their tireless efforts, the colleges have carved a name for themselves in the academic circle.

The college is situated in a serene atmosphere surrounded by picturesque mountains offering a very conducive environment for the academic perseverance. It is an ISO 9001:2008 certified institution and it has also been accredited by NAAC with ‘A’ grade. Committed to make quality education affordable especially to economically weaker sections particularly from rural area and strengthen the areas of research, enhance the process of sensitizing the students to personal values, spiritual growth and social responsibility. The college has taken every effort to ensure sustenance and enhancement of the quality in education.

Promoting Body

The Kovai Kalaimagal Educational Trust (KKET) was started in 1992 to establish educational institutions with the motto: ‘Light the Light within’. The trust has, so far, established Kovai Kalaimagal College of Arts and Science, Coimbatore Institute of Engineering and Technology, CIET School of Architecture and Coimbatore Institute of Management And Technology at Vellimalaipattinam, Narasipuram Post, Thondamuthur Via, Coimbatore - 641 109.

Environment

KKCAS is located at Vellimalaipattinam, near Narasipuram, sprawling over a land area of 10.58 acres, surrounded by green hillocks. The campus has a serene and studious atmosphere with least disturbance and distraction. The students find the environment to be very conducive for their studies. Facilities in the campus meet their needs for extra / co-curricular activities.

ISO 9001:2008

As our institution is an ISO 9001:2008 certified institution, we have a strong system which

takes care of the planned activities for enhancing quality in every respect. The institution implemented the Quality Management System and registered for the ISO certification since 2002. After implementation of the Quality Management System, not a single non-conformance was noticed in any of the QMS audit.

NAAC

Our institution was accredited with "A" grade by NAAC in the year 2011 and again Re-accredited with "A" grade by NAAC from September 2016.

Centre for Research

There is a research committee constituted in KKCAS which takes care of the promotion of research activities. Majority of members of faculty of Computer Science are the research guides guiding the scholars who pursue MPhil programme. This committee motivates the eligible faculty to apply for more number of research projects sponsored by UGC in topics of current interest.

The committee reviews the progress made by the research scholars periodically and advises them accordingly. In case the progress is not satisfactory, the reason for the same is found out and a solution to progress further is provided.

The committee recommends the research scholars and faculty pursuing Ph.D to participate and present papers in seminars and conferences and also publish research articles in reputed national and international journals. Those who are yet to register for pursuing M.Phil or Ph.D programmes are advised to register immediately and necessary support is also provided for finding suitable guides. The committee also recommends cash awards to those who publish research articles in refereed journals and sanction of additional increments and promotions to those who complete the Ph.D degrees. This has created a good impact as is evidenced by the number of faculty coming forward to pursue Ph.D programme.

Placement Cell

The institution has a placement cell which is effectively functioning under a placement officer and a placement coordinator. The responsibility of the placement officer is to identify the skills that are required to be possessed by the students as per the requirements of the companies and arrange for training programs for developing such skills among the students. Thus a number of training programs are organized to develop the communication skills, mathematical and English aptitude, group discussion and technical skills by the professors and professional trainers.

It also arranges career-counselling programmes through psychometric tests. These tests bring out the students strengths, weaknesses and their personal interests and attitude towards various career options available to them. If needed, it arranges for any follow-up programmes to overcome the weaknesses. Regular seminars are organized to enhance their capability for grabbing various career options.As a results nearly 75% of students are able to get placements from reputed companies.

Hostel

Separate and comfortable accommodation for boys and girls is provided within the college campus to accommodate 650 boys and 750 girls. Facilities for playing indoor games and common reading rooms with audio visual equipments are available in all the hostels.

The institution plans for providing residential accommodation to the staff and there is a proposal for the construction of staff quarters. As there is a separate RO plant, purified and safe drinking water is provided to all the students.

Recognitions

The college has been recognized for the welfare schemes implemented for the benefit of the students and has been rewarded with “Best College Award” during 2007 – 2008 by the Bharathiar University. It has also been awarded with “Third Best College Award” for overall performances during the year 2008-2009 based on ten different criteria such as Results of University Examinations, Conducting Seminars, Workshops, Symposia and State and National Level Conferences, Self Development Programmes for Students, Number of Placements made in the Campus Interviews, Student Supporting Services, Faculty Development Programmes, Publication of Books and Research articles in Journals and Magazines, Research Activities, Social Service through NSS, YRC and RRC and achievements in Sports and Games. The institute was awarded with “A” Grade by National Assessment and Accreditation Council (NAAC). The college was granted Autonomous status by UGC, New Delhi for six years with effect from 2016-2017.

KOVAI KALAIMAGAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous Institute Affiliated to Bharathiar University)

Re-accredited with "A" grade by NAAC

Regulations for Post Graduate Programmes

(Under Choice Based Credit System)

1. REGULATIONS

This regulation is effective from the academic year 2017 -'18.

1. 1 Eligibility for Admission

S.No.	Course	Eligibility Condition
1.	M.Sc (IT)	A pass with 50% marks in B.Sc (Computer Science) / Computer Technology / Information Technology / Electronics / Software Systems /Applied Sciences /BCA.

1.2 Duration and Course of study

Two Academic years with four semesters, the duration of the first and third from June to November and the second and fourth semesters from December to April. The duration of each semester is 90 working days with 5 hours a day.

1.3 The Medium of Instruction and Examinations

The medium of instruction and examinations shall be English.

1.4 Requirements for Attendance

a) A candidate will be permitted to take the examination for any semester, if he/she secures not less than 75% of attendance out of the 90 working days during the semester.

b) A candidate who has secured attendance less than 75% but 65% and above shall apply with the prescribed fee for the condonation of lack of attendance. On the recommendation of the Principal, he will be permitted to take up the examination.

c) A candidate who has secured attendance less than 65% but 55% and above in any semester, will be permitted to continue the course but will not be permitted to appear for the examination in the current papers. However he/she will be permitted to appear for the examination in the papers in which he/she has arrears. He/she will have to compensate the shortage of attendance in the subsequent semester and take the examination in the papers of both the semester together .

d) A candidate who has secured less than 55% of attendance in any semester will not be permitted to take the regular examinations and to continue the study in the subsequent semester. He/she has to re-do the course by rejoining in the semester in which the attendance is less than 55%.

e) A candidate who has secured less than 65% of attendance in the final semester has to compensate his / her attendance shortage in a manner to be decided by the Head of the Department concerned after rejoining the course.

1.5 Restriction to take the Examinations

a) Any candidate having arrear paper(s) shall have the option to take the examinations in any arrear paper(s) along with the subsequent regular semester papers.

b) Candidates who fail in any of the papers shall pass the paper(s) concerned within five years from the date of admission to the said course. If they fail to do so, they shall take the examination in the revised text / syllabus, if any, prescribed for the immediate next batch of candidates. If there is no change in the text / syllabus they shall take the examination in that paper with the syllabus in vogue, until there is a change in the text or syllabus.

In the event of removal of that paper consequent to the change of regulations and / or curriculum after a five year period, the candidates shall have to take up on equivalent paper in the revised syllabus as suggested by the chairman and fulfil the requirements as per regulations/curriculum for the award of the degree.

1.6 The Evaluation System

The major objective of the institution's evaluation system is to motivate all students to excel in their performance. The students' performance is continually assessed through Continuous Internal Assessment (CIA) and End Assessment Examinations(EAE). The CIA, EAE break up for theory papers is 25:75 and practical is 40:60.

1.6.1 Break Up of Continuous Internal Assessment (CIA) Marks

Theory

Content	Marks Awarded
Internal Assessment Test	05
Online Test	05
Model Examination	10
Assignment (1 Number) & Seminar (1 Number)	05
Total	**25**

Practical

Content	Marks Awarded
Minimum ten Experiments / Practical Paper / Semester	20
Internal Assessment Tests	05
Model Examination	10
Record Note Book	05
Total	**40**

Project Viva Voce

Content	Marks Awarded
Review & Content Presentation (3 Reviews) 3*40	120
Record	40
Total	**160**

1.6.2 End Assessment Examination (EAE)

a)Semester examination will be conducted at the end of each semester after completing a minimum of 90 working days.

b)End Assessment Examination for the odd semester will generally be held during November and even semester during April.

c)The question papers for all the courses will be set by the external examiners.

d)The exam will be conducted for a maximum of 75 marks for three hours. The passing minimum is 50% (38 out of 75 marks) and overall passing minimum putting the CIA and EAE marks together will be 50%.

e) Question Paper Pattern: **(Major & Elective)**

Part A	10 Marks	10 Questions - 1 Mark each-Objective Type
Part B	25 Marks	5 Questions- 5 Marks each – either or type.
Part C	40 Marks	5 Questions- 8 Marks each – either or type.
Total	**75 Marks**	

f)Extra Credit Course will be valued for a total of 100 marks. The pattern of the Question paper will be as follows:

Question paper pattern: (**Extra Credit Courses)**

Part A	40 Marks	5 Questions- 8 Marks each – either or type.
Part B	60 Marks	5 Questions- 12 Marks each – either or type.
Total	**100 Marks**	

g)The marks secured in the extra credit course will get reflected in the mark sheet only if

the candidate has secured 50% marks and above.

h)The students will be allowed to opt for only two papers per semester under the extra credit courses from first semester onwards.

i)The extra credit courses are self learning courses for which only guidance will be provided by the faculty.

j)There will be two independent valuations for all theory PG courses with first valuation by the course faculty and the second valuation by external examiner. The average marks of first and second valuation will be taken as the final marks. If there is a difference of 15% or more between the first and second valuations, then paper will be referred for third valuation and the average of the marks which are closer among the three valuations will taken as the final marks.

k)Supplementary examination will be conducted for the benefit of final year students after 15 days of the declaration of the final semester results. Candidate who has arrears in any semester subject to maximum of three papers can appear for the supplementary exam conducted after the final semester.

l)A candidate may request for re-totalling of his/her answer script by applying application addressing to the Controller of Examination through the Principal, paying prescribed fees. This provision is available for all theory papers taken in the EAE. However there is no provision for revaluation of theory/ practical papers.

m)Candidates desirous of improving the marks awarded in a passed subject in their first attempt shall reappear once within a period of subsequent two semesters. The improved marks shall be considered for classification but not for ranking. When there is no improvement, there shall not be any change in the original marks already awarded.

1.6.3 Break Up of End Assessment Examination (EAE) Marks

Practical

Content	Marks Awarded
Program - 1	20
Program - 2	20
Viva voce	10
Record	10
Total	**60**

Project Viva Voce

Content	Marks Awarded
Report	10
Power Point Presentation	**10**
Viva Voce	**20**
Total	**40**

1.7 Grading

The following table gives the marks grade points, letter grades and classification to indicate the performance of the candidate.

Conversion of Marks to Grade Points and Letter Grade

Range of Marks	Grade Points	Letter Grade	Description
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction
70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Average
00-49	0.0	RA	Re – Appear
ABSENT	0.0	AB	Absent

C_i = Credits earned for course i in any semester

G_i = Grade Point obtained for course i in any semester

n = refers to the semester in which such course were credited

For a Semester:

GRADE POINT AVERAGE [GPA] = $\sum_i C_i G_i / \sum_i C_i$

$$GPA = \frac{\text{Sum of the multiplication of grade points by the credits of the courses}}{\text{Sum of the credits of the courses in a semester}}$$

For the Entire Programme:

CUMULATIVE GRADE POINT AVERAGE [CGPA] = $\sum_n \sum_i C_{ni} G_{ni} / \sum_n \sum_i C_{ni}$

$$CGPA = \frac{\text{Sum of the multiplication of grade points by the credits of the entire programme}}{\text{}}$$

Sum of the credits of the courses of the entire programme

CGPA	Grade	Classification of Final Result
9.5 and above up to 10.0	O+	First Class – Exemplary*
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
0.0 and above but below 5.0	U	Re – Appearance

Classification of Successful Candidates

A candidate who passes all the examinations in Part I to Part V securing following CGPA and Grades shall be declared as follows for each part:

CGPA	Grade	Classification of Final Result
9.5 and above up to 10.0	O+	First Class – Exemplary*
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
0.0 and above but below 5.0	U	Re - Appearance

*** The candidates who have passed in the first appearance and within the prescribed semester of the Programme (Major and Elective Course alone) are eligible.**

1.8 Course Completion

Students shall complete the programme within a period not exceeding two years for PG courses from the date of admission.

SCHEME OF EXAMINATION AND PROGRAMME STRUCTURE
M.Sc (Information Technology) (2016-2018)

Sem	Sub code	Study Components	Ins. Hours per week	CIA	Exam	Total	Credits
Semester – I							
I	**16P1ITCT01**	**Core 1:** OOPS with C++ Programming	4	25	75	100	4
	16P1ITCT02	**Core 2:** Network Security	4	25	75	100	4
	16P1ITCT03	**Core 3:** Cyber laws and Security Polices	3	25	75	100	3
	16P1ITCT04	**Core 4:** Data Mining and Warehousing	4	25	75	100	3
	16P1ITCT05	**Core 5:** Software Testing	4	25	75	100	4
	16P1ITCP06	**Core 6:** C++ Programming - Practical	4	40	60	100	3
	16P1ITCP07	**Core 7:** Data Mining -Practical	3	40	60	100	3
		Library work	4	-	-	-	-
						Total Credits	**24**
Semester - II							
II	**16P2ITCT08**	**Core 8:** Distributed Computing and Linux	5	25	75	100	4
	16P2ITCT09	**Core 9:** Open Source Tools	4	25	75	100	4
	16P2ITCT10	**Core 10:** Object Oriented Analysis and Design	5	25	75	100	4
	16P2ITCP11	**Core 11:** Linux - Practical	4	40	60	100	3
	16P2ITCP12	**Core 12:** Open Source Tools-Practical	4	40	60	100	3
		Elective 1:	4	25	75	100	4
		Library work	4	-	-	-	-
						Total Credits	**22**
Semester – III							
III	**16P3ITCT13**	**Core 13:** Digital Image Processing	4	25	75	100	4
	16P3ITCT14	**Core 14:** Advanced Computer Networks	4	25	75	100	4
	16P3ITCT15	**Core 15:** Mobile Applications	4	25	75	100	3
	16P3ITCT16	**Core 16**: Web Programming	4	25	75	100	3
	16P3ITCP17	**Core 17:** Network - Practical	3	40	60	100	3
	16P3ITCP18	**Core 18:** Web Programming – Practical	3	40	60	100	3
		Elective 2:	4	25	75	100	4
		Library work	2	-	-	-	-
	16P3SBST01	**Skill Based Subject 1:** Technical Seminar and Report Writing	2	50	-	50	2
						Total credits	**26**
Semester – IV							

IV	**16P4ITCV19**	**Core 19:** Project Work and Viva Voce	-	160	40	200	18
						Total credits	**18**
Total			**90**			**2200**	**90**

Project and Viva Voce:

Project Work carries 200 marks with 18 credits . The breakup of marks will be as follows:-

Internal assesment :160 Marks (40 Marks for 3 reviews and 40 Marks for Record) and External Assesment : 40 Marks (Viva Voce)

List of Electives		
Sub Code		**Subjects**
Elective 1	16P2ITET1A	Grid Computing
	16P2ITET1B	Neural Network and Genetic Algorithm
	16P2ITET1C	Internet and E-Commerce
	16P2ITET1D	Multimedia and its Applications
Elective 2	16P3ITET2A	Soft Computing
	16P3ITET2B	Embedded System
	16P3ITET2C	Big Data Analytics
	16P3ITET2D	Software Project Management

Extra Credit Courses		
Sub.Code	**Subjects**	**Credits**
16PITECC01	Fuzzy Mathematics	2
16PITECC02	Operations Research	2
16PITECC03	Financial Accounting	2
16PITECC04	Management Information System	2
16PITECC05	Human Resource Management	2
16PITECC06	Principles of Marketing	2

Curriculum Structure

S.No.	**Courses**	**No. of Papers**	**Credits**
1	Core Courses	19	80
2	Electives	2	8
3.	Skill Based Subject	1	2
Total			90

SEMESTER I

CORE 1 : OOPS WITH C++ PROGRAMMING

Subject Code: 16P1ITCT01 **Total Hrs: 60** **No. of Credits: 4**

Objectives: To enable the students

- To learn about the basic concepts of object oriented programming and its various characteristics.
- To know about the basics of C++ programming language and its key features.
- To learn about functions, classes and inheritance concepts with its operations.
- To know about function overloading and exception handling concepts**.**

UNIT I **(Hours:12)**

Evolution of OOP, OOP Paradigm, advantages of OOP, Comparison between functional programming and OOP Approach, Characteristics of object oriented language-objects, classes, inheritance, reusability, user defined data types, polymorphism, overloading.Introduction to C++, Identifier and keywords, constants, C++ operators, type conversion,Variable declaration, statements, expressions, features of iostream.h and iomanip.h input andoutput, conditional expression loop statements, breaking control statements.

UNIT II **(Hours:12)**

Defining function, types of functions,storage class specifiers,recursion, preprocessor, header files and standard functions, Arrays, pointer arithmetic's,structures, pointers and structures,unions, bit fields typed, enumerations, Passing array as an argument to function.

UNIT III **(Hours:12)**

Classes, member functions, objects, arrays of class objects, pointers and classes, nested classes, constructors, destructors, inline member functions, static class member, friend functions, dynamic memory allocation. Inheritance, single inheritance, types of base classes, types of derivations,multiple inheritance, container classes, member access control

UNIT IV **(Hours:13)**

Function overloading, operator overloading, polymorphism, early binding, polymorphism with pointers, virtual functions, virtual destructors, late binding, pure virtual functions, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations, random access file processing.Exception Handling.

UNIT V **(Hours:11)**

Exception handling, Name spaces and Standard Template library (STL), Need of Exception handling, try, catch and throws keywords, defining namespace, benefit of namespace, Component of STL.

Reference Books:

1. Robert Lafore: "Object Oriented Programming in Turbo C++", Galgotia Publications, 2001.
2. Bjarne Stroustrup: "The C++ Programming Language", Wesley Publications, 1999 , 3rd Edition.
3. E.Balagurusamy:"Object Oriented Programming with C++",Tata Mc.Graw Hill,2nd Edition,2004.
4.M.TSomashekara, D.S Guru, H.S.Nagendrasamy,K.S.Manjunath:"Object Oriented Programming in C++", 2nd Edition,2012.

SEMESTER I

CORE 2: NETWORK SECURITY

Subject Code: 16P1ITCT02 **Total Hrs:60** **No. of Credits: 4**

Objectives: To enable the students

- To know about cryptography and its various functions.
- To understand the concepts of hashes and public key algorithm.
- To have a knowledge on different types of authentication.
- To know about the standards, IP security and their applications**.**

UNIT I **(Hours:12)**

Cryptography - Introduction – Primer on Networking –Active and Passive Attacks –Layers and Cryptography – authorization Viruses, worms, Trojan Horses – The Multi level Model of Security. Cryptography – Breaking an Encryption Scheme – Types of Cryptographic functions – secret key Cryptography – Public key Cryptography – Hash algorithms.

UNIT II **(Hours:15)**

Secret Key Cryptography - Secret Key Cryptography – Generic Block Encryption – Data Encryption Standard – International Data Encryption Algorithm (IDEA) – Advanced Encryption Standard. Modes of Operation: Encrypting a Large message – ECB, CBC, OFB, CFB, CTR – Generating MACs – Multiple Encryption DES.

UNIT III **(Hours:10)**

Hashes and Public Key Algorithms - Hashes and Message Digests: Introduction – Things to do with hash – MD2 – MD4 – MD5. Public Key Algorithms: Modular arithmetic – RSA – Diffie-Hellman – Digital Signature Standard – Elliptic Curve Cryptography – Zero Knowledge proof systems.

UNIT IV **(Hours:12)**

Authentication - Overview of Authentication Systems: Password-Based Authentication – Address-Based Authentication – Cryptographic Authentication Protocols –Eavesdropping and Server Database Reading – Trusted Intermediaries – Session Key Establishment. Authentication of People: Passwords – On-line and Off-line Password of Guessing – Eavesdropping – Passwords and Careless Users – Initial Password Distribution – Authentication Tokens.

UNIT V **(Hours:11)**

Standards, IP Security and Applications - Standards: Kerberos V4: Introduction – Tickets and Ticket-Granting Tickets – Configuration – Logging into the Network – Replicated KDCs. IP Security: Overview of IPSec – IP and IPv6 – Authentication Header – ESP. Applications: Email Security – PGP – Firewalls.

Reference Books:

1. Charlie Kaufman, Radia Perlman and MikeSpeciner : “Network Security Private Communication in a Public World”, Pearson Education, New Delhi, 2nd Edition,2008 .
2. Stallings William : “Cryptography and Network Security Principles and Practices”, Prentice Hall India, New Delhi, 4th Edition 2007.
3. Stallings William : “ Network Security Essentials Applications and Standards “ Prentice Hall India, New Delhi, 2004.
4. Atul Kahate : “Cryptography and Network Security “ Tata Mc.Graw Hill , 2nd Edition, 2008.

SEMESTER I

CORE 3 : CYBER LAWS AND SECURITY POLICIES

Subject Code:16P1ITCT03 **Total Hrs : 45** **No. of Credits: 3**

Objectives: To enable the students to have

- an overview of Information Security and Assurance.
- an exposure to the spectrum of security activities, methods and methodologies.
- Knowledge on infrormation securtity policies and procedures.

UNIT I **(Hours: 12)**

Introduction to Computer Security: Definition, Threats to security, Government requirements, Information Protection and Access Controls, Computer security efforts, Standards, Computer Security mandates and legislation, Privacy considerations, International security activity.

UNIT II **(Hours: 12)**

Secure System Planning and administration, Introduction to the orange book, Security policy requirements, accountability, assurance and documentation requirements, Network Security, The Red book and Government network evaluations.

UNIT III **(Hours: 12)**

Information security policies and procedures: Corporate policies- Tier 1, Tier 2 and Tier3 policies - process management-planning and preparation-developing policies-asset classification policy-developing standards.

UNIT IV **(Hours: 12)**

Information security: fundamentals-Employee responsibilities- information classification-Information handling- Tools of information security- Information processing-secure program administration.

UNIT V **(Hours: 12)**

Organizational and Human Security: Adoption of Information Security Management Standards, Human Factors in Security- Role of information security professionals.

References Books:

1. Debby Russell and Sr. G.T Gangemi, "Computer Security Basics (Paperback)", 2ndEdition, O' Reilly Media, 2006.
2. Thomas R. Peltier, "Information Security policies and procedures: A Practitioner's Reference", 2nd Edition Prentice Hall, 2004.
3. Kenneth J. Knapp, "Cyber Security and Global Information Assurance: Threat Analysis and Response Solutions", IGI Global, 2009.
4. Thomas R Peltier, Justin Peltier and John blackley, "Information Security Fundamentals", 2nd Edition, Prentice Hall, 1996

SEMESTER I

CORE 4: DATA MINING AND WAREHOUSING

Subject Code: 16P1ITCT04 **Total Hrs: 60** **No. of Credits: 3**

Objectives: To enable the students

- To know the basics of data mining and data warehousing
- To understand various techniques in data mining
- To learn about architecture of data warehouse and its applications

UNIT I **(Hours:15)**

Basic data mining tasks – data mining versus knowledge discovery in databases – data mining issues – data mining metrices – social implications of data mining – data mining from a database perspective. Data mining techniques: Introduction – a statistical perspective on data mining – similarity measures – decision trees – neural networks – genetic algorithms.

UNIT II **(Hours:11)**

Classification: Introduction – Statistical – based algorithms - distance – based algorithms – decision tree - based algorithms - neural network – based algorithms – rule - based algorithms – combining techniques.

UNIT III **(Hours:15)**

Clustering: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms - Partitional Algorithms. Association rules: Introduction - large item sets - basic algorithms – parallel & distributed algorithms – comparing approaches - incremental rules – advanced association rules techniques – measuring the quality of rules.

UNIT IV **(Hours:09)**

Data warehousing: introduction - characteristics of a data warehouse – data marts – other aspects of data mart. Online analytical processing: introduction - OLTP & OLAP systems– data modeling –star schema for multidimensional view –data modeling – multifact star schema or snow flake schema – OLAP TOOLS – State of the market – OLAP TOOLS and the internet.

UNIT V **(Hours:10)**

Developing a data WAREHOUSE: why and how to build a data warehouse – data warehouse architectural strategies and organization issues - design consideration – data content – metadata distribution of data – tools for data warehousing – performance considerations – crucial decisions in designing a data warehouse. Applications of data warehousing and data mining in government: Introduction – national data warehouses – other areas for data warehousing and data mining.

Reference Books:

1. Margaret H. Dunham: “Data Mining Introductory and Advanced topics”, Pearson education, Sixteenth Impression ,2013 .
2. C.S.R. Prabhu: “Data Warehousing concepts, Techniques, Products and Applications”, PHI, Third Edition, 2012 .
3. Arun K.Pujari : “Data Mining Techniques”, Universities Press (India) Pvt. Ltd., Third Edition ,2013.
4. Alex Berson, Stephen J. Smith: “Data Warehousing, Data mining, & OLAP”, Tata Mc. Graw Hill, 2008.

SEMESTER I

CORE 5: SOFTWARE TESTING

Subject Code: 16P1ITCT05 **Total Hrs: 60** **No. of Credits: 4**

Objectives: To enable the students

- To learn about the fundamentals of software testing
- To learn about various strategic approaches and its implementation
- To clearly understand various techniques of software testing

UNIT I **(Hours:12)**

Purpose of software testing-some Dichotomies-a model for testing-Is complete testing possible - The Consequences of bugs-Taxonomy of bugs. Software testing fundamentals: Test case design-Introduction of Black Box Testing and White Box Testing.

UNIT II **(Hours:12)**

A Strategic approach to software testing-issues-unit testing-Integration testing-validation testing-system testing-The art of debugging. Flow graph and path testing-Path testing Basics-Predicates, Path predicates and achievable path-Path sensitizing-path instrumentation-implementation and application of path testing.

UNIT III **(Hours:14)**

Transaction flow testing-Transaction flows – techniques - Implementation comments - Data flow testing - Basic - strategies - applications, tools and effectiveness - Testing tips.

UNIT IV **(Hours:12)**

Syntax testing - Why, What, How-Grammar for Formats - Implementation -Tips. Logical Based testing - Motivational overview - Decision tables-states, state Graphs and Transition testing - state Graphs - Good and Bad states - State testing metrics and complexity.

UNIT V **(Hours:10)**

Testing web application: Introduction-Functional and usability issues-Configuration and compatibility testing-Reliability and Availability-performance-security-End to End transaction testing-Database testing.

Reference Books:

1. Boris Beizer: “Software Testing Techniques”, Dream tech Press, 2nd Edition, 2003 .
2. Roger.S.Pressman: “Software Engineering-A Practioner’s Approach”, McGraw Hill, Fifth Edition ,2001.
3. Louise Tamres: “Introducing Software Testing”, Pearson education First Reprint, 2002
4. Srinivasan Desikan:”Software Testing Principles and Practices”Pearson education Sixth Edition,2006.

SEMESTER I

CORE 6: C++ PROGRAMMING - PRACTICAL

Subject Code: 16P1ITCP06 **Total Hrs: 60** **No. of Credits: 3**

Objective: To enable the students to gain knowledge in developing C++ Programs for certain specified problems.

1. Write a C++ program to find the largest of three numbers using inline function.

2. Write a C++ program to sort an array of integer in ascending order using a function called exchange( ) which accepts two integer arguments by reference.

3. Write a C++ program to implement function overloading in order to compute power(m,n) where

   i) m is double and n is int ii) m and n are int.

4. Create a class called 'EMPLOYEE' that has

   - EMPCODE and EMPNAME as data members

   - member function getdata( ) to input data

   - member function display( ) to output data

   Write a main function to create EMP, an array of EMPLOYEE objects. Accept and display the details of at least 6 employees.

5. Create a class 'COMPLEX' to hold a complex number. Write a friend function to add two complex numbers. Write a main function to add two COMPLEX objects.

6. Create a 'MATRIX' class of size m X n. Overload the '+' operator to add two MATRIX objects. Write a main function to implement it.

7. Write a C++ program to illustrate Multiple Inheritance.

8. Write a C++ program to illustrate 'this' pointer and pointers to derived classes.

9. Design your own manipulator to provide the following output specification for printing money value: 1) 10 columns width 2) The character '$' at the beginning

3) Showing '+' sign. 4) Two digits precision

5) Filling of unused spaces with ' * ' 6) Trailing zeros shown

10. Define a function template for finding the minimum value contained in an array.Write main( ) function to find the minimum value of integer array and minimum value of floating point numbers in an array.

11.Program to create a class called QUEUE with the member functions to add and to delete an element from the queue.

12. Program to demonstrate namespaces and Volatile member functions.

13.Program to perform all possible Type Conversions

14. Program to implement different types of inheritances like Multiple, Multilevel and Hybrid.

15. Program to demonstrate the use of Virtual Functions

SEMESTER I

CORE 7: DATA MINING - PRACTICAL

Subject Code: 16P1ITCP07 **Total Hrs: 45** **No. of Credits: 3**

1.Demonstration of preprocessing on dataset student.arff

2.Demonstration of preprocessing on dataset labor.arff

3.Demonstration of Association rule process on dataset contactlenses.arff using apriori algorithm

4.Demonstration of Association rule process on dataset test.arff using apriori algorithm

5.Demonstration of classification rule process on dataset student.arff using j48 algorithm

6.Demonstration of classification rule process on dataset employee.arff using j48 algorithm

7.Demonstration of classification rule process on dataset employee.arff using id3 algorithm

8.Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm

9.Demonstration of clustering rule process on dataset iris.arff using simple k-means

*10.*Demonstration of clustering rule process on dataset student.arff using simple k-means

SEMESTER II

CORE 8: DISTRIBUTED COMPUTING AND LINUX

Subject Code: 16P2ITCT08 **Total Hrs: 75** **No. of Credits: 4**

Objectives: To enable the students

- To know about distributed system and its applications
- To learn about network operating systems, its architecture and its various operations
- To learn about Linux operating system and its operations

UNIT I **(Hours:15)**

Introduction-Definition of a Distributed System- Goals- Connecting Users and Resources – Openness – Scalability – hardware Concepts: Multiprocessors – Homogeneous multicomputer systems – Heterogeneous Multicomputer Systems – Software Concepts: Distributed operating Systems - Network Operating Systems – Middleware-v The Client-Server model: Cline and Servers – Application layering – Client Server Architectures.

UNIT II **(Hours:15)**

Processes: Threads - clients – code migration: Approaches to code migration – Migration and Local Resources – Migration in Heterogeneous Systems – Software agents – Naming: naming Entities: names, identifiers and Addresses – Name resolution - The implementation of a namespace – Locating Mobile entities: Naming versus Locating entities – Simple solutions – Removing unreferenced entities.

UNIT III **(Hours:15)**

Synchronization: clock Synchronization - Physical Clock – Synchronization algorithms – use of Synchronized clocks – logical clocks - Global State –Election algorithms - Mutual Exclusion – Distributed Transactions – consistency and Replication – Data Centric Consistency Models: Linearizability and Sequential Consistency – Weak Consistency – Distribution protocols: Replica placement – Update Propagation.

UNIT IV **(Hours:14)**

Fault Tolerance: Introduction to fault tolerance – Process resilience: design issues – Failure Masking and replication – Reliable Client-Server Communication: Point to Point Communication – RPC semantics in the presence of failures – Reliable group of Communication: basic Reliable – multicasting Schemes – Overview of CORBA – Overview of DCOM - Overview of NFS - Overview of WWW.

UNIT V **(Hours:16)**

Linux Operating systems : Introduction – History of UNIX and Linux – System Features – Software Features – Differences between Linux and Other Operating System – hardware requirements - sources of Linux Information – Linux Startup and Setup : User accounts – Accessing the linux system – Unix Commands – Linux File Structure: Linux file types – File structures – managing Files - Managing Directories – File and Directory operation .

File Management Operation: File and Directory permissions – Jobs – System Administration – Shells in Linux - Shell operations: Command Line – Standard Input/Output- Redirection – Pipes – Shell Scripts – Shell Variables - Arithmetic Shell Operations – Control Structures.

Reference Books:

1.Andrew S.Tanenbaum and Marten Van Steen: “Distributed Systems Principles and Paradigms” , PHI, 2004.
2.Richard Petersen: “The Complete Reference – Linux”, TMH,Fifth Edition,2004.
3.Pradeep K.Sinha: “Distributed Operating Systems”, PHI, Indian Edition,2004.
4.George coulouris, Jean Dollimore and Tim Kindberg: “Distributed Systems Concepts and Design” , Pearson Education, Third Edition ,2002.

SEMESTER II

CORE 9: OPEN SOURCE TOOLS

Subject Code: 16P2ITCT09 **Total Hrs: 60** **No. of Credits: 4**

Objectives: To enable the students

- To know about the open sources and its linux as one of the free open source software
- To learn about APACHE and its uses
- To learn about MySQL and its uses
- To learn about PHP and its uses

UNIT I **(Hours:12)**

OPEN SOURCE Introduction : Open Source – Open Source vs. Commercial Software – What is Linux? - Free Software – Where I can use Linux? Linux Kernel – Linux Distributions

UNIT II **(Hours:12)**

LINUX Introduction: Linux Essential Commands – Filesystem Concept - Standard Files - Vi Editor – Partitions creation - Shell Introduction - String Processing– Installing Application

UNIT III **(Hours:12)**

Open Source Web servers: Installation, configuration and administration of Apache, Nginx. Open Source Tools , IDE, RDBMS: Eclipse IDE ,OpenStack cloud technology, Version Control Systems , GIT , CVS. Open Source Repositories :GitHub, SourceForge, Google Code. Open Source RDBMS: MySQL basics, installation and usage. PostgreSQL,NoSQL, MongoDB, Hadoop.

UNIT IV **(Hours:10)**

Introduction to MY SQL - The Show Databases and Tab le - The USE command - Create Database and Tables - Describe Table - Select, Insert, Update, and Delete statement - Some Administrative detail - Table Joins - Loading and Dumping a Database.

UNIT V **(Hours:14)**

Introduction: General Syntactic Characteristics - PHP Scripting - Commenting your code - Primitives, Operations and Expressions - PHP Variables -Operations and Expressions Control Statement - Array - Functions - Basic Form Processing - File and Folder Access - Cookies - Sessions - Database Access with PHP - MySQL - MySQL Functions - Inserting Records - Selecting Records - Deleting Records - Update Records.

Reference books:

1. James Lee and Brent Ware: “Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", Dorling Kindersley(India) Pvt. Ltd, 2008.

2. Eric Rosebrock, Eric Filson: "Setting up LAMP: Getting Linux, Apache, MySQL and PHP and working Together", Published by John Wiley and Sons, 2004.

SEMESTER II

CORE 10: OBJECT ORIENTED ANALYSIS AND DESIGN

Subject Code: 16P2ITCT10 **Total Hrs: 75** **No. of Credits: 4**

Objectives: To Enable the Students

- To learn about the basics of objects and object oriented methodologies
- To understand about object oriented analysis through various approaches
- To know about object oriented design and its various patterns
- To clearly understand UML, its programming and its applications

UNIT I **(Hours:15)**

Object Basics: Introduction – An Object - Oriented Philosophy – Objects – Attributes – Object Behavior And Methods – Objects Respond To Messages – Encapsulation And Information Hiding – Class Hierarchy – Polymorphism – Object Relationships And Associations – Aggregations And Object Containment – Meta-Classes – Object- Oriented System Development Life Cycle.

UNIT II **(Hours:15)**

Object-Oriented Methodologies: Rumbaugh Object Modeling Technique – The Booch Methodology – The Jacobson Methodologies – Patterns – Frameworks – The Unified Approach.

UNIT III **(Hours:16)**

Object-Oriented Analysis: Business Object Analysis – Use-Case Driven Object-Oriented Analysis – Business Process Modeling – Use-Case Model – Object Analysis – Noun Phrase Approach –Common Class Pattern Approach – Use-Case Driven Approach – Classes, Responsibilities And Collaborators.

UNIT IV **(Hours:14)**

Object-Oriented Design: Object-oriented Design Process – Object-Oriented Design Axioms – Corollaries –Design Patterns - designing classes – case study.

UNIT V **(Hours:15)**

UML and Programming: Introduction – Static and Dynamic Models – Introduction to the Unified Modeling Language – UML Diagrams – UML Class Diagram – Use Case Diagram – UML Dynamic Modeling – Case study to inventory, sales and banking.

Reference Books:

1. Ali Bahrami: “Object Oriented Systems Development”, Irwin-McGraw Hill, New Delhi, International Edition ,2008.
2. Gredy Booch: “Object Oriented Analysis and Design With Applications”, Addition Wesley, New York, Second Edition,1994 .
3. Martin Fowler: “UML Distilled”, PHI Education, Third Edition,2002.
4. Rumbaugh, James, Jacobson, Ivar, and Booch, Grady: “The Unified Modeling Language Reference Manual”, Addison Wesley, New York, Third Edition,2008.

SEMESTER II

CORE 11: LINUX PRACTICAL

Subject Code: 16P2ITCP11 **Total Hrs: 60** **No. of Credits: 3**

1. Write the shell script to check the status of file using test command.
2. Write the shell script to find the grade of student's marks.
3. Write a menu driven shell program to perform the following.
   i) Enter the sentence in file.
   ii) Search a whole word in an existing file.
   iii) Quit.
4. Write a shell script to perform case conversion.
5. Write a shell script to find the sum of digits.
6. Write a shell script to find the biggest of three numbers using command line arguments. Check for sufficient number of command line arguments.
7. Write a shell script to copy, delete and renaming a file.

C - Linux

1. Implementation of system calls – Open, read and close.
   Create, write, lseek, stat, fstat.
2. Implementation of fork & exec.
3. Inter process communication using messages, pipes and queues.

SEMESTER II

CORE 12: OPEN SOURCE TOOLS - PRACTICAL

Subject Code: 16P2ITCP12 **Total Hrs:60** **No. of Credits: 3**

Objective: To enable the students to gain knowledge in developing programs of Open Source Tools for certain specified problems.

1. Write a shell script to show the following system configuration :
   a. currently logged user and his log name
   b. current shell , home directory , Operating System type , current Path setting ,current working directory.
   c. show currently logged number of users, show all available shells
   d. show CPU information like processor type , speed.
   e. show memory information.

2.Write a shell script to implement the filter commands

3. Create a mysql table and execute queries to read, add, remove and modify a record from that table.

4. Write a PHP program interface to create a database and to insert a table into it.

5. Write a PHP program using classes to create atable.

6. Write a PHP program to upload a file to the server.

7. Write a PHP program to access the data stored ina mysql table.

8. Write a PHP program to create a directory, and to read contents from thedirectory.

9. Write a server side PHP program that displays marks, total, grade of a student in tabular format by accepting user inputsfor name, number andmarks from a HTML form.

10. Write a PHP program that adds products that are selected from a web page to a shopping cart.

SEMESTER III

CORE 13: DIGITAL IMAGE PROCESSING

Subject Code: 16P3ITCT13 **Total Hrs:60** **No. of Credits: 4**

Objectives:

- To provide an idea about the fundamentals of digital image processing and the methods of Representation
- To understand about various methods image Transormation and different approaches for image Enhancement.
- To Understand about Compression and Restoration of image using Matlab.

UNIT I **(Hours: 12)**

Fundamental Of Digital Image Processing **:** Steps in Image Processing – Building blocks of a digital image processing system – Digital Image Representation : Introduction - Digital image representation - Sampling and Quantization – Basic Relationship between pixels -Neignbors and Connectivity – Distance Measure.

UNIT II **(Hours: 12)**

Image Transformation : Introduction – Fourier Transformation – Discrete Fourier transformation – Properties – Fast Fourier Transformation – Discrete Cosine Transformation – The Haar Transformation.

UNIT III **(Hours: 11)**

Image Enhancement : Introduction – Sample Domain and Frequency Domain Approaches – Techniques – Spatial Domain Techniques – Spatial Filtering – Frequency Domain – Gray Level to Color Transformation **.**

UNIT IV **(Hours: 13)**

Image Compression : Introduction – Coding Redundancy – Inter Pixel Redundancy - Psycho Visual Redundancy – Image Compression models – The Source Encoder and Decoder – Lossy Compression Techniques – Threshold Coding – Vectoer Quantization – Image Compression Standard(JPEG)-Image Restoration.

UNIT V **(Hours: 12)**

Image Segmentation : Introduction – Detection of Isolated Points – Line Detection – Edge Detection – Edge Linking and Boundary Detection – Region Oriented Segmentation – Segmentation using Thresolding – Accumulative Difference Image.

Reference Books :

1. S.Annadurai & R. Shanmugalakshmi: " Fundamentals of Digital Image Processing ", Dorling Kindersley (India) PVT., Ltd,2007
2. Rafael c. Gonzalea, Richard E. Woods: "Digital Image Processing", Second Edition, PHI/Person Education
3. B.Chabds, D.Dutta Majumder: " Digital Image Processing and Analysis ", PHI, 2003
4. Nick Efford: "Digital Image Processing Introduction using Java", Pearson Education , 2004.

SEMESTER III

CORE 14: ADVANCED COMPUTER NETWORKS

Subject Code: 16P3ITCT14 **Total Hrs:60** **No. of Credits: 4**

Objectives: To enable the students

- To learn the digital networks & internet protocols
- To have a clear idea about various functions of TCP and UDP.
- To learn about user networks interfaces and protocols of on B-ISDN and its operations and maintenance.

UNIT I **(Hours: 13)**

Introduction to Data Communications and Networking : Introduction – Fundamentals concepts – Data Communication – Protocals – standards – Standards organization – signal propagation- analog and Digital signals.

Analog and Digital Transmission methods: Introduction – Analog signal , Analog Transmission – Digital Signal , Digital Transmission – Digital Signal , Analog Transmission – Analog signal , Digital Transmission.

UNIT II **(Hours: 12)**

Transmission Media – Introduction – Guided Media – Unguided Media . Network Topologies , switching and routing algorithms: Introduction – Mesh , Star, Tree , Ring, Bus , Hybrid Topologies. Switching Basics – Circuit , packet , Message switching - Router and Routing – Routing Algorithms.

UNIT III **(Hours: 11)**

Networking Protocal and OSI Model : Introduction – Protocals in computer communication – the OSI Model – OSI Layer Functions. TCP/IP : TCP - UDP – DNS – Email - FTP - TFTP.

UNIT IV **(Hours: 13)**

ISDN : ISDN Introduction – Background of ISDN – ISDN Architecture – ISDN Interfaces – Functional Grouping – Reference Point – ISDN Protocals Architecture – Broadband ISDN (B-ISDN) – X.25 Protocal: Understanding how X.25 Works – Characteristics X.25 – Packet Format X.25 operation.

UNIT V **(Hours: 11)**

Overview of ATM : Introduction – What is ATM ? Genesis of ATM – Basic Principles of ATM – Precursor Techologies – B-ISDN and ATM – ATM Standards.

Reference Books:

1.Achyut Godbole: “Data Communication and Networks”, Tata MaGraw-Hill, Seventh Reprint 2007.

2. Sumit Kasera & Pankaj Sethi: “ ATM Networks concetps and protocols” , TMH, 2003.

3.Uyless Black: “Computer Networks - Protocols, Standards, and Interfaces” , Prentice-Hall International, 1993.

4.William Stallings: “ISDN and BroadBand ISDN with Frame Relay and ATM”, Pearson Education, 4 th Edition, 2009.

SEMESTER III

CORE 15: MOBILE APPLICATIONS

Subject Code: 16P3ITCT15 **Total Hrs:60** **No. of Credits: 3**

Objectives:

- To understand the knowledge of Android and Its Applications
- To understand the testing , security design and architecture in Android

UNIT I **(Hours:13)**

Getting Started-Understanding the Android Life Cycle-Installing .apk Files onto an emulator via the Adb-installing apps onto an emulator via slideme-sharing java classes from another eclipse project-referencing libraries to implement external functionality-using sdk samples to help avoid head scratching-keeping the android sdk updated

Testing-Doing test-Driven development(TDD) in android-setting up in Android Virtual Device (AVD) for app testing-testing on a huge range of devices with cloud based testing-creating and using a test project –troubleshooting application crashes-getting bug reports from users automatically with bug sense-reproducing activity life cycle scenario for testing.

UNIT II **(Hours:12)**

Inter-/Intra-ProcessCommunication-Introduction: Inter-/Intra-Process Communication-opening a webpage, phone number or anything else with an intent-emailing text from a view-sending an Email with attachments-creating a responsive application using threads-sending messages between threads using an activity thread queue and handler-creating an android Epoch HTML/JAVA Script calendar.

Content Provider-Introduction-Content Provider-Retreiving Data from a content provider-Writing a content provider-Writing an android remote service.

UNIT III **(Hours:13)**

Graphics-Introduction-using a custom font-drawing a spinning cube with opengl es-adding controls to the opengl spinning cube-freehand drawing smooth curves taking a picture using intent –taking a picture using android.media.camera-scanning a barcode or qr code with the google zxing barcode scanner-using androidplot to display charts and graphs-using inkspace to create an android launcher icon-creating easy launcher icons from open clipart.org using paint.net-using nine patch files-creating html5 charts with android rgraph-adding a simple raster animation-using pinch to zoom.

UNIT IV **(Hours:12)**

Android Security Design And Architecture-Understanding Android System Architecture-Understanding Security Boundaries And Enforcement-Androids Sandbox-Android Permissions-Looking Closer At The Layers-Android Applications-The Android Framework-The Dalvik Virtual Machine-User-Space Native Code-The Kernel-Complex Security,Complex Exploits.

UNIT V **(Hours:10)**

Case Study-Telephone Applications-Networked Applications-Gaming And Animation-Social Networking-Location And Map Applications.

Reference Books:

1. Ian F. Darwin: “Android Cook Book”, Shroff Publishers and Distributors PVT Limited.
2. Joshua J . Drake: “Android Hackers Handbook” -Wiley Publishers,

SEMESTER III

CORE 16: WEB PROGRAMMING

Subject Code: 16P3ITCT16 **Total Hours: 60** **No.of Credits: 3**

Objectives: To enable the students

- To learn about the basic concepts of various computer and internet.
- To learn about the concepts of cascading style sheet.
- To learn about the Java Scripts and XML.
- To learn about the various web servers.

UNIT I **(Hours: 11)**

Introduction to Computers and internet: HTML5, CSS3, Javascript, W3C, Data Hierarchy, types of programming languages, HTML5: editing, example, validation service, headings, linking, images, characters, lists, tables, forms, meta elements, Input types, datalist elements, page structure elements.

UNIT II **(Hours: 12)**

Cascading Style Sheets: Inline, embedded style sheets, conflicting styles, Positioning elements, backgrounds, element dimensions, box model, menus, text shadows, corners, color, box shadows, radial gradient, multiple background, image borders. Java Script: first script, prompt dialogs, memory, arithmetic, decision making.

UNIT III **(Hours: 12)**

Java Script: control statement – algorithms, pseudo code, control statements, if selection, if...else, while repetition, counter-controlled repetition, sentinel-controlled repetition, nested control statements, assignment operators, increment and decrement. Control Statements II: for repetition, switch multiple, do...while, break, continue and logical operators.

UNIT IV **(Hours: 13)**

Java Script function definitions and array declaring and allocating.XML: basics, structuring data, XML namespace, DTDs, XML vocabularies, DOM. AJAX: introduction, RIA with AJAX, History, “RAW” Ajax using XMLHttpRequest object.

UNIT V **(Hours: 12)**

Web Servers (apache & IIS): HTTP transactions, Client-side scripting, accessing web servers, Apache, MySql, PHP Installation, Microsoft IIS. Web App development with ASP.Net in C#: web basics, multitier architecture, first ASP.NET, web controls, validation, Session tracking.

Web services in C#: introduction, WCF, SOAP, REST, JSON, publishing and consuming SOAP, REST –based XML, REST based JSON, Blackjack web service.

Reference Book:

1. Paul Deitel, Harvey Dietel and Abbey Dietel: “Internet & World Wide Web – How to Program”, Fifth Edition, Tata McGraw Hill.

SEMESTER III

CORE 17: NETWORK -PRACTICAL

Subject Code: 16P3ITCP17 **Total Hours: 45** **No.Of Credits: 3**

Objective: To enable the students to gain knowledge in developing Network Programs for certain specified problems.

1. To write a java program to perform sliding window.

2. Implementaion of socket programming date and time display from client to server using TCP

Sockets.

3. Write a code simulating ARP /RARP protocols.

4. Write a code simulating PING and TRACEROUTE commands.

5. Create a socket for HTTP for web page upload and download.

6. Write a program to implement RPC (Remote Procedure Call).

7. Implementation of Subnetting.

8. Applications using TCP Sockets like Echo client and echo server.

9. Applications using TCP Sockets like File Transfer.

10. Java program for Dns application program.

11. Java program for SNMP application program .

12. Java program for applaction using TCP and UDP Sockets Links.

SEMESTER III

CORE 18: WEB PROGRAMMING- PRACTICAL

Subject Code: 16P3ITCP18 **Total Hours: 45** **No.Of Credits: 3**

Objective: To enable the students to gain knowledge in developing Web Programming Programs for certain specified problems.

1. Write a HTML program with basic HTML Tags (Headings, Linking, Images with attributes, special characters).
2. Write a HTML program with basic HTML Tags (tables, lists, forms, meta elements).
3. Write a HTML program with HTML Tags (Input type tag – color, date, datetime, email, month, number).
4. Write a HTML program with HTML Tags (input, data list and auto complete attributes).
5. Write a CSS program with inline styles, embedded style, linking, backgrounds, drop down menus.
6. Write a CSS program with positioning elements – absolute, z-index, relative and span.
7. Write a CSS program with text shadows, rounded corners, color, gradients and animations.
8. Write a CSS program with box shadows, text stroke, transition and transforms.
9. Write a Java script program with prompt dialogs (adding, subtracting, multiplication and dividing integers).
10. Write a Java script program with decision making – equality and relational operators.
11. Write a Java script program with control statements (if, if ... else, logical operators).
12. Write a Java script program with for, do...while, while and switch statements.
13. Write a Java script program with java script functions, arrays and objects.
14. Write a XML program with XML namespace, DTD.
15. Write a simple PHP Program with operators, expressions.

SEMESTER - III

SKILL BASED SUBJECT 1:TECHNICAL SEMINAR AND REPORT WRITING

Subject Code: 16P3SBST03 **Total Hrs: 30** **No. of Credits: 2**

Guidelines for

Technical Seminar & Report Writing

Technical Seminars

Seminar is a course requirement wherein under the guidance of a faculty member a student is expected to do an in depth study in a specialized area by doing literature survey, understanding different aspects of the problem and arriving at a status report in that area. While doing a seminar, the student is expected to learn investigation methodologies, study relevant research papers, correlate work of various authors/researchers critically, study concepts, techniques, prevailing results etc., analyze it and present a seminar report. It is mandatory to give a seminar presentation before a panel constituted for the purpose. The grading is done on the basis of the depth of the work done, understanding of the problem, report and presentation by the student concerned.

Seminar Report

Students must carefully go through the report preparation guidelines.

The first draft of the report complete in all respects must be submitted at least one month prior to the date of submission of the final report.

The report must reflect the students' understanding of the problem.

The student is expected to write his own report without plagiarism

Presentation

Students also need to make a mock presentation to the M.Sc students one week prior to the final presentation date. This would enable the student to make corrections either in the slides or in the presentation so that he/she is better prepared for the final presentation.

Report Writing

This document may be referred as report writing guide It may be used for the preparation of seminar and project reports associated with M.Sc Programs.

Contents

Merits of evaluation

1. Regularity:

Based on:

Whether the student has kept the guide updated on his progress (at least one contact hour per week).

2) Quality of work:

Based on:

Depth of work done and understanding of the problem.

Whether the student has learnt investigation methodologies described above.

3) Quality of report:

Based on:

Whether the student has expressed his/her understanding of the topic.

Whether the student has followed the guidelines given for report preparation.

4) Quality of presentation:

Based on:

Whether the student has been able to express his/her understanding of the topic.

Whether the student has been able to satisfactorily answer questions of the panel members.

Evaluation weightages

Merit of evaluation	**Guide**	**Examiner**	**Panel member**
Regularity	15%	-	-
Quality of work	15%	15%	10%
Quality of report	10%	15%	-
Quality of presentation	-	-	20%

SEMESTER IV

CORE 19 : PROJECT VIVA VOCE

Subject Code : 16P4ITCV19 **No.of Credits : 18**

Objective: To enable the students to apply practically in a specific area using any specific domain knowledge he/she posses and get the results.

GUIDELINES FOR PROJECT WORK

- The aim of the project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- Each student should carry out individually one project work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea focusing on application oriented concepts.
- The project work should be compulsorily done in the college only under the supervision of the department staff concerned.

FINAL VIVA VOCE

- Project work carries 200 marks with 20 credits
- Internal Assessment: 160 marks (40 marks for 3 reviews and 40 marks for record) and External Assessment : 40 marks (Viva Voce)
- For awarding a pass, a candidate should have obtained 50% of the total 200 Marks.
- The evaluation would be done jointly by both the examiners(Internal and External). Students who fail in the project work and viva-voce examination or who are absent for the project viva-voce who fail to submit the project report before the due date will have to re-submit the project work and appear for the viva-voce examination during the subsequent year.

SEMESTER II

ELECTIVE 1 : GRID COMPUTING

Subject Code: 16P2ITET1A **Total Hrs: 60** **No. of Credits: 4**

Objectives: To enable the students

- To understand basics of Grid Computing and its various techniques
- To know about desktop grids, cluster grids, HPC & data grids and its role & practical uses
- To have knowledge of open grid architecture creating, managing grid services and grid enabling software application

UNIT I **(Hours:12)**

Basic values of grid computing: Introduction Business values – Risk Analysis – Grid market place. Grid Computing Technology – An Overview: Introduction – History – High performance computing – Cluster computing – Peer-to-Peer Computing – Internet Computing – Grid Computing Model – Grid Protocols – Globus Toolkit – Open Grid Services Architecture - Types of Grids.

UNIT II **(Hours:12)**

Desktop Grids: Introduction – Background – Grid value proposition – Challenges – Suitability – Grid Server – Role of Desktop grids in an enterprise computing infrastructure – Practical uses of desktop grids. Cluster Grids: Introduction – Clusters – Industry Examples – Cluster grids.

UNIT III **(Hours:12)**

HPC Grids: Introduction – Five steps to scientific insight – Applications and Architectures – HPC application development environment – Production HPC Reinvented – HPC Grids. Data Grids: Introduction – Data grids – Alternatives to data grids – Avaki data grid – Data grid architecture.

UNIT IV **(Hours:14)**

The Open Grid Architecture: Introduction – An analogy for OGSA – the evolution of OGSA – OGSA overview – Building on the OGSA Platform – Implementing OGSA based grids. Creating and Managing Grid Services: Introduction – Services and the grid – Converting existing software – Service discovery – Operational requirements – Tools and Toolkits – Support in UDDI – UDDI and OGSA.

UNIT V **(Hours:10)**

Desktop Supercomputing: Native programming for grids – Grid-Enabling Software Applications – Managing Grid Environments – Grid computing adoption in Research and Industry.

Reference Books:

1. Ahmar Abbas: “GRID Computing-A Practical guide to Technology and Applications, Firewall Media, 2008.
2. Ethan cerami Oreilly: “Web Services essentials”
3. Joshy Joseph,Craig Fellenstein:”Grid Computing”,Indian Edition,2004.
4. MaoghenLI,Mark Baker:”Grid Core Technologies”,Indian Edition,2010.

SEMESTER II

ELECTIVE 1 : NEURAL NETWORKS AND FUZZY LOGIC

Subject Code: 16P2ITET1B **Total Hrs: 60** **No. of Credits: 4**

Objectives: To enable the students

- To learn about the basics of neural networks and its applications
- To know about artificial neural networks and its processes
- To understand about Feed forward neural networks, competitive learning neural networks and their various methodologies

UNIT I **(Hours:12)**

Basics of Neural Networks: Human Brain - Models of Neuron –Network Architectures – Artificial Intelligence and Neural Networks – Historical Development. Learning Process: Error Correction Learning-Memory Based Learning-Hebbian Learning-Competitive Learning – Boltzmann Learning.

UNIT II **(Hours:12)**

Introduction to ANS Technology: Elementary Neurophysiology – From Neurons to ANS – ANS Simulation. Signal Processing: Signal Processing & Filtering –Applications of Adaptive Signal Processing.

UNIT III **(Hours:12)**

Feed Forward Neural Networks: Introduction – Analysis of Pattern Association Networks – Analysis of Pattern Classification Networks – Analysis of Pattern Mapping Networks. Feed Back Neural Networks**:** Introduction – Analysis of Pattern Storage Networks.

UNIT IV **(Hours:14)**

Competitive Learning Neural Networks: Introduction – Components of a Competitive Learning Network – Analysis of Feedback Layer for Different Output Functions – Analysis of Pattern Clustering Networks – Analysis of Feature Mapping Network.

UNIT V **(Hours:10)**

Applications of Artificial Neural Networks: Introduction – Direct Applications – Application Areas: Applications in Speech, Image Processing, Decision Making.

Reference Books:

1. Simon Haykin: “Neural Networks”, Pearson Education, 2006.
2. James A. Freeman and David M. Skapura: “Neural Networks Algorithms, Applications and Programming Techniques”, Pearson Education, 2002.
3. B.Yegnanarayana: “Artificial Neural Networks”, Prentice Hall Inc, 2006.
4. L. Fu : “Neural Networks in Computer Intelligence”, Tata McGraw Hill, New Delhi, 1994.

SEMESTER II

ELECTIVE 1 : INTERNET AND E-COMMERCE

Subject Code: 16P2ITET1C **Total Hrs:60** **No. of Credits: 4**

Objectives: To enable the students

- To understand about internet and its operations
- To know about internet protocols, electronic mail and its operations
- To learn about the electronic commerce framework, its various types and its functions

UNIT I **(Hours:12)**

Internet: An Introduction –What Special about the internet-You don't have to be a Mechanic to Drive a Car!-Internet Access/Dial-up Connection-Internet Services features. Getting Connected: Introduction. The World Wide Web (WWW): Web page-Net Surfing. Internet/Web Browsing: Microsoft Internet Explorer-Viewers-Favorites-Netscape Navigator-Lynx. Internet Addressing: what is Internet Addressing-IP Address-Domain Name-Electronic Mail-Uniform Resource Locator (URL).

UNIT II **(Hours:12)**

Internet Protocols**:** TCP/IP-File Transfer Protocol (FTP)-Hypertext Transfer Protocol (HTTP)-Telnet-Gopher. Searching the Web: Web Index-Web Search Engine-Web Meta-Searcher-Electronic Mail (E-Mail):E-Mail Message-Pine-Finding an E-Mail Address-Mailing Lists-Smileys-E-Mail Ethics-E-Mail –Advantages and Disadvantages-Some Useful E-mail Services.

UNIT III **(Hours:12)**

Electronic Commerce framework**:** Electronic Commerce of Media convergence- The Anatomy of E-commerce applications – Electronic Commerce Applications – Electronic Commerce Organization Applications – Market Forces Influencing the I-way – Components of the I-way – Network Access Equipment – the Last Mile: Local roads and access Ramps – Global Information Distribution Networks – Public policy Issues shaping the I-way.

UNIT IV **(Hours:12)**

Architectural framework for electronic commerce: World Wide Web (WWW) as the Architecture – Web background: Hypertext Publishing – Technology behind the Web – Security and the Web – Consumer-Oriented Applications – Mercantile Models from the Consumer's Perspective – Mercantile Models from the Merchant's Perspective.

UNIT V **(Hours:12)**

Types of Electronic payment systems: Digital Token-Based Electronic Payment Systems – Smart cards and Electronic Payment Systems – Credit Card based Electronic Payment Systems – Risk and Electronic Payment Systems – Designing Electronic Payment Systems -Electronic Data Interchange – EOI Applications in Business – EDI: Legal, Security, and Privacy issues – EDI and Electronic Commerce.

Reference Books:

1. Alexis Leon, Mathews Leon: "Internet for Everyone" Leon Tech World.
2. Ravi Kalakota, Andrew B. Whinston: "Frontiers of Electronic Commerce", Pearson Education Asia, 2003.
3. Jeffery F. Rayport, Bernard J. Jaworski: "E- Commerce", TMCH, 2002.
4. R.Krishnamoorthy, S.Prabhu: "Internet and Java Programming", New Age International Publishers.

SEMESTER II

ELECTIVE 1 : MULTIMEDIA AND ITS APPLICATIONS

Subject Code: 16P2ITET1D **Total Hrs:60** **No. of Credits: 4**

Objectives:

- To learn the overview of Multimedia systems.
- To learn about the Basic concepts of Sound and Image Processing.
- To learn about the Multimedia Applications.

UNIT I **(Hours:13)**

Media and Data Streams : Medium – Main Properties of a Multimedia Systems – Multimedia – Traditional Data Streams Characteristics – Data Streams characteristics for continuous media.

UNIT II **(Hours:12)**

Sound / Audio: Basics sound Concepts – Music – Speech . Video and Animation : Basics concepts – Television – Computer Based Animations.

UNIT III **(Hours:12)**

Images and Graphics : Basics concepts – Computer Image Processing – Data Compression : Storage space – coding requirement – source entropy and hybrid coding – some basic compression techniques – JPEG – MPEG – DVI.

UNIT VI **(Hours:10)**

Multimedia Communication system : Application subsystem – Transport subsystem – quality of services and resource management.

UNIT V **(Hours:13)**

Multimedia Applications : Introduction – Media Preparation – Media Composition – Media Integration – Media Communication – Media Entertainment.

Reference Book:

1. Ralf Steinmetz and Klara Nahrstedt , Multimedia : “Computing , Communication & Applications” , Pearson Education.

SEMESTER III

ELECTIVE 2 : SOFT COMPUTING

Subject Code: 16P3ITET2A **Total Hrs:60** **No. of Credits: 4**

Objective: To understand the Fundamentals of Neural Network Concepts.

- To enhance knowledge in Fuzzy logic and Strategies.
- To capture the basic things ANN Algorithms.
- To familiarize with soft computing concepts.
- To introduce the ideas of Neural networks, fuzzy logic.
- To introduce the concepts of Genetic algorithm and its applications.

UNIT I **(Hours: 12)**

Fundamentals of ANN: The Biological Neural Network, Artificial Neural Networks - Building Blocks of ANN and ANN terminologies: architecture, setting of weights, activation functions - McCulloch-pitts Neuron Model , Hebbian Learning rule, Perception learning rule, Delta learning rule.

UNIT II **(Hours; 13)**

Models of ANN: Single layer perception, Architecture, Algorithm, application procedure - Feedback Networks: Hopfield Net and BAM - Feed Forward Networks: Back Propogation Network (BPN) and Radial Basis Function Network (RBFN) - Self Organizing Feature Maps: SOM and LVQ .

UNIT III **(Hours: 11)**

Fuzzy Sets, properties and operations - Fuzzy relations, cardinality, operations and properties of fuzzy relations, fuzzy composition.

UNIT IV **(Hours: 11)**

Fuzzy variables - Types of membership functions - fuzzy rules: Takagi and Mamdani – fuzzy inference systems: fuzzification, inference, rulebase, defuzzification.

UNIT V **(Hours: 12)**

Genetic Algorithm (GA): Biological terminology – elements of GA: encoding, types of selection, types of crossover, mutation, reinsertion – a simple genetic algorithm – Theoretical foundation: schema, fundamental theorem of GA, building block hypothesis.

Reference Books:

1. S. N. Sivanandam, S. Sumathi, S.N. Deepa: “Introduction to Neural Networks using MATLAB 6.0” , Tata McGraw-Hill, New Delhi, 2006
2. S. N. Sivanandam, S.N. Deepa: “Principles of Soft Computing”, Wiley-India, 2008.
3. 3. Satish Kumar: “Neural Networks – A Classroom approach”, Tata McGraw-Hill, New Delhi, 2007.

SEMESTER III

ELECTIVE 2 : EMBEDDED SYSTEMS

Subject Code: 16P3ITET2B **Total Hrs:60** **No. of Credits: 4**

Objectives: To Enable the Students

- To learn about embedded system and its architecture
- To know about processor, device and memory organization
- To understand the software algorithm complexity and life cycle of software development
- To know about real time operating system and its operations

UNIT I **(Hours:12)**

Introduction to embedded system, what is ES, application areas, categories of ES, specialties of embedded system, recent trends in embedded system, hardware architecture of embedded system, software architecture. An embedded system, processor in the system, software embedded into a system.

UNIT II **(Hours:12)**

Processor and memory organization, structural units, processor selection for an embedded system, memory devices, memory selection for an embedded system, direct memory access, I/O devices, timer and counting devices, serial communication using I^2C, CAN, Parallel communication between multiple device using ISA, PCI.

UNIT III (**Hours:12)**

Device drivers, parallel port device drivers, serial port device drivers in a system, interrupt servicing mechanism. Modeling process for software analysis, programming models, for even controlled constrained programs, modeling of multiprocessor system.

UNIT IV (**Hours:12)**

Software algorithm complexity, software development process life cycle, analysis, design, implementation, software testing, validating and debugging, software maintenance, UML. Multiple processes in an application, Inter-process communication, case study on coding for an automatic chocolate vending machine.

UNIT V (**Hours:12)**

Real time operating systems, operating systems services, I/O subsystems, Network operating systems, real time and embedded system operating systems. Embedded system project management, design and co-design issues, design cycle in the development phase for and embedded system, uses of target system for or its emulator and In-Circuit Emulator (ICE).

Reference Books:

1. Raj Kamal: “Embedded systems – Architecture, Programming and Design”, Tata Mc-Graw Hill publishing company limited, New Delhi,2007
2. Kenneth J. Ayala: “The 8086 microprocessors: Programming Interfacing the PC”, Penram International publishing (India).

SEMESTER III

ELECTIVE 2 : BIG DATA ANALYTICS

Subject Code: 16P3ITET2C **Total Hrs:60** **No. of Credits: 4**

Objectives :

- To explore the fundamental concepts of big data analytics
- To develop in-depth knowledge and understanding of the big data analytic domain.
- To learn to analyze the big data using intelligent techniques.
- To understand the various search methods and visualization techniques.
- To learn to use various techniques for mining data stream.
- To understand the applications using Map Reduce Concepts

UNIT I **(Hours : 12)**

Introduction :To Big Data: Introduction to BigData Platform – Traits of Big data -Challenges of Conventional Systems -Web Data – Evolution Of Analytic Scalability - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

UNIT II **(Hours : 12)**

Data Analysis: Regression Modeling - Multivariate Analysis - Bayesian Modeling - Inference and Bayesian Networks - Support Vector and Kernel Methods - Analysis of Time Series: Linear Systems Analysis - Nonlinear Dynamics - Rule Induction - Neural Networks: Learning And Generalization - Competitive Learning - Principal Component Analysis and Neural Networks -Fuzzy Logic: Extracting Fuzzy Models from Data - Fuzzy Decision Trees - Stochastic Search Methods.

UNIT III **(Hours : 12)**

Mining Data Streams : Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing -Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream –Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT IV **(Hours : 12)**

Frequent Itemsets And Clustering **:** Mining Frequent Itemsets - Market Based Model – Apriori Algorithm – Handling Large Data Sets in Main Memory – Limited Pass Algorithm – Counting Frequent Itemsets in a Stream –Clustering Techniques – Hierarchical – K-Means – Clustering High Dimensional Data –CLIQUE And PROCLUS – Frequent Pattern based Clustering Methods – Clustering in Non-Euclidean Space – Clustering for Streams and Parallelism.

UNIT V **(Hours : 12)**

Frameworks And Visualization **:**Map Reduce – Hadoop, Hive, MapR – Shading – NoSQL Databases - S3 - Hadoop Distributed File Systems – Visualizations - Visual Data Analysis Techniques - Interaction Techniques; Systems and Analytics Applications - Analytics using Statistical packages-Approaches to modelling in Analytics – correlation, regression, decision trees, classification, association-Intelligence from unstructured information-Text analytics-Understanding of emerging trends and technologies-Industry challenges and application of Analytics

Reference Books:

1. Michael Berthold, David J. Hand: “Intelligent Data Analysis”, Springer, 2007.

2. AnandRajaraman and Jeffrey David Ullman: “Mining of Massive Datasets”, Cambridge University Press, 2012.

3. Bill Franks: “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, John Wiley & sons, 2012.

4. Glenn J. Myatt: “Making Sense of Data”, John Wiley & Sons, 2007

5. Pete Warden: “Big Data Glossary”, O’Reilly, 2011.

6. Jiawei Han, MichelineKamber: “Data Mining Concepts and Techniques”, Second Edition, Elsevier, Reprinted 2008.

SEMESTER III

ELECTIVE 2 : SOFTWARE PROJECT MANAGEMENT

Subject Code: 16P3ITET2D **Total Hrs: 60** **No. of Credits:4**

Objectives:

- To get knowledge of how to handle project development activities
- To understand the threats and opportunities in Project managements
- To study various project cost, time estimation models.
- To study how to make quality software products.
- To Appreciate management issues like team structure and group dynamics

UNIT I **(Hours : 10)**

SOFTWARE PROJECT MANAGEMENT: Introduction, Need for Software Project Management – Software Project versus other projects – Overview of Project planning

UNIT II **(Hours:10)**

PROJECT EVALUATION: **I**ntroduction, Strategic assessment, Technical Assessment, Cost benefit Analysis, Cash flow forecasting, Cost benefit Evaluation Techniques Risk Evaluation – Selection of appropriate project planning.

UNIT III **(Hours:14)**

ACTIVITY PLANNING **:**Objectives of activity planning, Project schedules, Projects and activities, Sequencing and scheduling activities, Network Planning models –Formulating network models, Using dummy activities, Identifying critical path, identifying critical activities. Risk Analysis and Management: Nature of risk, Managing risk, Risk identification, Risk analysis, reducing the risks, evaluating the risks.

UNIT IV **(Hours:14)**

SOFTWARE EFFORT ESTIMATION: Problems with over and under estimate, the basis for software estimation, software estimation Techniques. Expert judgments, Estimating by analogy, Function point analysis. Resource Allocation: Identifying resource requirements, Scheduling resources, Monitoring and control, Managing people and organization teams.

UNIT V **(Hours:12)**

PROJECT MANAGEMENT **:**Project Management in the Testing phase – Introduction, test scheduling, test types, issues, management structures for testing, metrics for testing phase, Project Management in the Management phase – Introduction, activities, management issues, configuration management, estimating size, effort and people resources, advantages, metrics.

Reference Books:

1. Bob Hughes and Mike Cotterell: “Software Project Management”, Fifth Edition, Tata McGraw Hill.
2. Gopalaswamy Ramesh: “Managing Global Software Projects”, 2001, TMH.
3. Walker Royce: “Software Project Management”, 1998, Addison Wesley
4. Stellman & Greener: ”Applied software project management”, SPD.

EXTRA CREDIT COURSE: FUZZY MATHEMATICS

Subject Code: 16PITECC01 **No. of Credits: 2**

Objectives:

- To know the basic concepts of fuzzy stes and its characteristics.
- To understand the concept of various operations on fuzzy sets.
- To learn the concept of fuzzy relations and its applications.

UNIT I

From classcal sets to Fuzzy sets: Introduction-Crisp Sets: An over vieww-Fuzzy set: Basic types-Fuzzy sets: Basic Concepts-Characteristics and significance of the paradigm Shift.

UNIT II

Fuzzy sets of versus crisp sets: Addtional properties of α- Cuts- Representations of fuzzy sets-Extension Principle of Fuzzy sets.

UNIT III

Operations on fuzzy sets: Types of Operations-Fuzzy complements-Fuzzy Intersections: t-Norms-Fuzzy unions: t-conorms.

UNIT IV

Fuzzy Arithmetic: Fzzy Numbers-Lnguistic Variables-Arithmetic Operations on intervals

UNIT V

Fuzzy Relations: Crisp versus Fuzzy Relations-Projections and Cylndric Extensions-Binary Fuzzy Relations-Binary relations on a single set-Fuzzy Equvalence Relations-Fuzzy Compatibility Relations.

Text Book:

1.Fuzzy Sets Uncertanity and Information, George, J.Klir and Tina A, Folger, Printice Hall of India Pvt Ltd, New Delh, 2006

UNIT 1: Page no: 1-30
UNIT 2: Page no: 35-48
UNIT 3: Page no: 50-96
UNIT 4: Page no: 97-102
UNIT 5: Page no: 119-135

Reference Book:

1. Fuzzy Logic Intellegence, Control and information, John Yuan, Reza Langari, Pearson Education, New Delh, 1999
2. Fuzzy logc and Neural Networks, M.Amirthavalli, Scitech Publications Pvt Ltd, Chennai and Hydrabad, 2007
3. Fuzzy Logic with Engineering Applications, Timothy , Jo Ross, McGraw-Hill INC, New York, 1996.

EXTRA CREDIT COURSE: OPERATIONS RESEARCH

Subject Code: 16PITECC02 **No. of Credits: 2**

Objectives:

- To understand the basic concepts of Operations Research and Solving LPP
- To solve Transportation and Assignment problems
- To understand the concept of Game theory , Queuing theory PERT and CPM.

UNIT I

Introduction to Operations Research - Meaning - Scope – Models - Limitation. Linear Programming - Formulation – Graphical method only.

UNIT II

Transportation (Non- degenerate only) - Assignment problems - Problems.

UNIT III

CPM - Principles - Construction of Network for projects – Types of Floats – Slack- crash programme.

UNIT IV

PERT - Time scale analysis - critical path - probability of completion of project - Advantages and Limitations.

UNIT V

Game Theory: Graphical Solution – mx2 and 2xn type. Solving game by Dominance property - fundamentals - problems . Replacement problem – Replacement of equipment that deteriorates gradually (value of money does not change with time).

*** Questions in problems and theory carry 80% and 20% marks respectively.**

Text Book:

1. Prof. V. Sundaresan., K.S. Ganapathy Subaramanian ., K.Ganesan: Resource Management Techniques (Operations Research) A.R.Publications- 2002

Unit I **:** Chapter 1 – Section 1.1,1.2,1.4,1.9, Chapter 2 – Section 2.1- 2.5
Unit II **:** Chapter 7 – Section 7.1- 7.2, Chapter 8 – Section 8.1 ,8.2,8.4,8.5
Unit III **:** Chapter 15 – Section 15.1,15.2,15.5,15.8
Unit IV **:** Chapter 15 – Section 15.6
Unit V **:** Chapter 16 – Section 16.6, 16.7, Chapter 11 – Section 11.1, 11.2

Reference Books:

1. Kanti Swarup, Gupta P.K, Man Mohan : Operations Research, Sultan Chand & Sons- 1997.
2. P.R. Vittal and V.Malini : Operations Research, Margham Publications -2011.
3. P.K.Gupta.,ManMohan: Problems in Operations Research,Sultan Chand &sons-2004
4. V.K.Kapoor: Operations research, Sultan Chand&sons-2007.

EXTRA CREDIT COURSE: FINANCIAL ACCOUNTING

Subject Code: 16PITECC03 **No. of Credits: 2**

Objectives:

- To enable the students to learn principles and concepts of accountancy
- To make the students understand basic accounting framework
- To provide adequate knowledge on consignment, joint venture and depreciations

UNIT I

Fundamentals of Book Keeping- Accounting Concepts and Convention – Objectives of Accounting – Advantages of Accounting – Limitations of Accounting - Journal-Ledger -Subsidiary books - Trial balance- Errors and Rectification.

UNIT II

Final Accounts of a sole trader with adjustments - Trading Account – Profit and Loss Account – Balance sheet.

UNIT III

Accounts of Non Trading Concerns - Receipts and Payments Account - Income and Expenditure Accounts and Balance Sheet - Bank Reconciliation Statement.

UNIT IV

Accounting for Consignments – Account Sales – Valuation of Stock – Normal Loss – Abnormal Loss - Joint ventures – Joint Venture Vs. Consignment – Accounting for Joint Ventures – Separate books.

UNIT V

Accounting for depreciation –Methods of depreciation - Straight line method, Diminishing balance method, Annuity method – Single entry system – Single entry system Vs. Double entry system – Satement of Affairs method – Conversion method - Total Debtors – Total Creditors – Bills Receivable – Bills Payable.

Note: Distribution of marks between problems and theory shall be 80% and 20%.

Text Books:

1) T.S.Reddy and Dr.A. Murthy:“Financial Accounting”, Margham Publications, Chennai,Reprint 2016.
2) S.P.Jain and K.L.Narang: “Advanced Accountancy”, Kalyani Publishers, New Delhi, 17th Revised Edition, 2011.

Reference Books:

1. T.S. Grewal: “Introduction to Accountancy”, Sultan Chand & Co., New Delhi, 8th Revised Edition, 2013.
2. K.L.Nagarajan, N.Vinayakam and P.L.Mani: “Principles of Accountancy”, Eurosia Publishing House (Pvt) Ltd., New Delhi, Reprint 2010
3. R.L.Gupta and M.Radhaswamy: “Advanced Accountancy”, Sultan Chand & Sons, New Delhi,Reprint 2008.

EXTRA CREDIT COURSE: MANAGEMENT INFORMATION SYSTEM

Sub Code: 16PITECC04 **No. of Credits: 2**

Objectives:

- To familiarise the students with Business Information through Computers.
- To enable the students aware of utilization of business information for decision making.
- To bestow knowledge about Database Management System

UNIT I

Management information system: meaning – features – requisites of effective MIS – MIS Model – components – subsystems of an MIS – role and importance – corporate planning for MIS – growth of MIS in an organization – centralization vs decentralization of MIS - Support – Limitations of MIS.

UNIT II

System concepts – elements of system – characteristics of a system – types of system – categories of information system – system development life cycle – system enhancement.

UNIT III

Information systems in business and management: Transaction processing system: Information repeating and executive information system.

UNIT IV

Database management systems – conceptual presentation – client server architectures networks.

UNIT V

Functional management information system: Financial – accounting – marketing – production – Human resource – business process outsourcing.

Text Books:

1. Gorden B.Davis and Margrethe H.Olson: “Management Information System”, Tata McGraw Hill Publication, New Delhi, 1st Edition, 2005.
2. Aman Jindal: “Management Information system”, Kalyani Publishers, New Delhi, First Edition, 2004.

Reference Books:

1. Kenneth C. Laudon: “Management Information System”, Pearson Education, New Delhi, First Edition, 2004.
2. Stephen Haag: “Management Information System”, Tata McGraw Hill Publication, New Delhi, First Edition, 2008.

EXTRA CREDIT COURSE: HUMAN RESOURCE MANAGEMENT

Subject Code: 16PITECC05 **No. of Credits: 2**

Objectives:

- To understand the nature of human resources and its significance to the organization
- To familiarise students with the various techniques in HRM that contribute to the overall effectiveness of an Organization.
- To bring the attention of the students on the latest trends in managing human resources in an organization.

UNIT I

Human Resource Management: Definition – Objectives – Functions - evolution and growth of HRM– qualities of a good HR manager – changing roles of a HR Manager-– problems and challenges of a HR manager.

UNIT II

Planning the Human resources :Definitions of human resource planning – objectives – steps in human resources planning – dealing with surplus and deficient man power - job analysis – job description – job specification.

UNIT III

Recruitment & Selection: Recruitment and selection – objectives of recruitment – sources – internal and external recruitment – application blank – testing – interviews.

UNIT IV

Training & Development: Training and development – principles of training – assessment of training needs – on the job training methods - off the job training methods – evaluation of effectiveness of training programmes.

UNIT V

Performance Appraisal:Performance appraisal– process – methods of performance appraisal – appraisal counseling – Motivation process – theories of motivation – managing grievances and discipline.

Text Books:

1. Tripathi - Personnel Management, Sultan Chand & Sons, New Delhi, 2000.
2. L M Prasad, Human Resource Management, Sultan Chand & Sons, New Delhi, 2005.

References Books:

1. Aswathappa, Human Resource Management, Tata Mc Graw Hill Publishing Company, New Delhi, 1999.
2. Davis and Werther, Human Resource Management, Tata Mc Graw Hill Publishing Company, New Delhi, 2000.

EXTRA CREDIT COURSE: PRINCIPLES OF MARKETING

Subject Code: 16PITECC06 **No. of Credits: 2**

Objectives:

- To make the students understand about the modern marketing and marketing concepts
- To enlighten the students' knowledge on consumer behaviour and rights of consumers
- To provide knowledge on advertisement and its uses

UNIT I

Marketing – Definition of Market and Marketing – Classification of Marketing-Marketing and selling,Objectives -Importance of Marketing – Modern Marketing Concepts - E-Marketing – Tele Marketing – Green Marketing- Service Marketing-Digital Marketing-Mobile Marketing-Social Media Marketing.

UNIT II

Marketing Function – Buying – Selling – Transportation – Storage – Financing – Risk Bearing – Standardization – Marketing Information System.

UNIT III

Marketing Mix – 7 'P's Marketing Mix-Product Mix – Product Life cycle – Branding – Labelling – Price Mix-Importance-Pricing Objectives – Pricing Strategies – Personal selling and Sales Promotion- Channels of Distribution-Functions of Middlemen-Place Mix.

UNIT IV

Consumer Behaviour -Meaning- Need for studying Consumer Behaviour - Factors influencing Consumer Behaviour - Market Segmentation – Customer Relationship Marketing-Consumerism-Rights of Consumerism - Consumer Protection Council- Bureau of Indian Standards – AGMARK

UNIT V

Meaning and Definition of Advertising - Objectives - Advantages of Advertising - Classification of Advertisement Copy-Advertising Media-Advertising Agencies.

Text Books:

1. R.S.N. Pillai and Bagavathi: “Modern Marketing Principles and Practices”, S.Chand & Co., Ltd., New Delhi, Edition 2011.
2. Philip Kotler and Gary Armstrong: “Principles of Marketing”, Pearson Eduction Pvt., Ltd., New Delhi.Edition 2012.

Reference Books:

1.S.A. Shelekar: “Marketing Management” Himalaya Publishing House, New Delhi, 13th Edition Reprint 2010.
2.Dr.C.B. Gupta and Dr.N, Rajan Nair: “Marketing Management”, S.Chand & Sons, New Delhi, 7th Edition Reprint 2000.
3.www.professionalacademy.com/blogs-and-advice/marketing-theories-the-marketing-mix-from-4-p-s.